

-6-

Remarks

This application has been reviewed in light of the Office Action of March 30, 2007. Claims 1-20 are pending and all claims are rejected. In response, claims 1, 4, 11, 13, and 16 are amended; new claim 21 is added; and the following remarks are submitted. Reconsideration of this application, as amended, is requested.

**Ground 1.** Claims 4 and 13 are rejected under 35 USC 112. Applicant traverses this ground of rejection.

Claim 4 is rejected for lack of antecedent basis for "the substrate." Claim 4 is amended responsively.

Claim 13 is rejected for an erroneous reference to the parent claim, and has been amended responsively.

**Ground 2.** Claims 1-8, 10-13, and 15 are rejected under 35 USC 102 over Muller U.S. Patent 6,452,086. Applicant traverses this ground of rejection.

The following principle of law applies to §102 rejections. MPEP 2131 provides: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the ... claim. The elements must be arranged as required by the claim..." [citations omitted] This is in accord with the decisions of the courts. Anticipation under §102 requires 'the presence in a single prior art disclosure of all elements of a claimed invention arranged as in that claim.' Carella v. Starlight Archery, 231 USPQ 644, 646 (Fed. Cir., 1986), quoting Panduit Corporation v. Dennison Manufacturing Corp., 227 USPQ 337, 350 (Fed. Cir., 1985).

Thus, identifying a single element of the claim, which is not disclosed in the reference, is sufficient to overcome a §102 rejection.

The structure 5a, 5b referenced in the explanation of the rejection is the back-side electrical contact (col. 2, line 60). Applicant has amended claim 1 to recite the presence of the back-side metallization (33) of the present invention, and that the intermediate structure lies between the back-side metallization and the heat sink. This amendment clarifies that the heat sink is a structure different from the back-side metallization.

Thus, claim 1 as amended recites:

-7-

"a solar cell having...a back side..., wherein the solar cell includes a back-side metallization at the back side; and  
an intermediate structure disposed between and joined to the back-side metallization of the solar cell and to the heat sink..."

If the metallization 5a, 5b of Muller is correctly identified as the back-side metallization contact, then Muller discloses no heat sink. If the metallization 5a, 5b is incorrectly identified as a heat sink, then Muller discloses no back-side metallization.

Claim 1 additionally recites in part:

"a heat sink;"

Muller does not disclose the presence of a heat sink. The elements 5a, 5b identified in the explanation of the rejection are metallization "contact surfaces," and are not identified as "heat sinks" and are not identified as having the capability to perform as heat sinks.

Muller does not disclose the limitations of claim 1.

Claims 2-8 and 10 depend from claim 1 and are therefore also allowable.

Amended claim 11 now recites the metallization as discussed for claim 1, which is not disclosed for the reasons stated above.

Amended claim 11 also recites in part:

"a discrete by-pass diode..."

As stated in para. [0028] of the Specification, "'Discrete' means that the diode is not integral with the solar cell and deposited with the solar cell 26. Instead, the diode is manufactured separately from the solar cell 26." Muller clearly states that its diode is formed by diffusion processes in the solar cell (col. 2, lines 46-54), and therefore is not a "discrete" diode.

Muller does not disclose the limitations of claim 11.

Claims 12-13 and 15 depend from claim 11 and are therefore also allowable.

**Ground 3.** Claims 1-15 are rejected under 35 USC 102 as anticipated by Glenn U.S. Patent 6,313,396. Applicant traverses this ground of rejection.

Claim 1 recites in part:

"a heat sink"

Glenn does not disclose a heat sink. The explanation of the rejection identifies element 20 of Glenn as a heat sink. Substrate 20 is in fact a substrate that is made of a dielectric (*i.e.*, nonconducting) material, and is preferably a material such as Kapton film (col. 6, lines 31-44). Substrate 20 of Glenn cannot perform as a heat sink.

Claim 1 as amended also recites:

"a solar cell having...a back side..., wherein the solar cell includes a back-side metallization at the back side; and  
an intermediate structure disposed between and joined to the back-side metallization of the solar cell and to the heat sink..."

If there is an attempt to analogize the substrate 20 of Glenn to the recited heat sink (which is not possible, as discussed above), then no intermediate structure lies between a metallization and the substrate 20 of Glenn.

Glenn does not disclose the limitations of claim 1.

Claims 2-10 depend from claim 1 and are therefore also allowable.

Amended claim 11 also recites the "heat sink" and the back-side metallization as discussed above. Glenn does not disclose these limitations, because it has no heat sink and it has no back-side metallization--the conductors of Glenn are buried inside the solar cell.

Claims 11-15 depend from claim 11 and are therefore also allowable.

**Ground 4.** Claims 1 and 5-7 are rejected under 35 USC 102 as anticipated by Hokuyo U.S. Patent 4,997,491. Applicant traverses this ground of rejection.

The electrode 403 referenced in the explanation of the rejection is the back-side electrical contact (col. 4, lines 20-21). Applicant has amended claim 1 to recite the presence of the back-side metallization (33) of the present invention, and that the intermediate structure lies between the back-side metallization and the heat sink. This amendment clarifies that the heat sink is a structure different from the back-side metallization.

Thus, claim 1 as amended recites:

-9-

"a solar cell having...a back side..., wherein the solar cell includes a back-side metallization at the back side; and  
an intermediate structure disposed between and joined to the back-side metallization of the solar cell and to the heat sink..."

If the electrode 403 of Hokuyo is correctly identified as the back-side metallization contact, then Hokuyo discloses no heat sink. If the electrode 403 is incorrectly identified as a heat sink, then Hokuyo discloses no back-side metallization. Element 100 of Hokuyo is the substrate of the solar cell.

Claim 1 additionally recites in part:

"a heat sink;"

Hokuyo does not disclose the presence of a heat sink. The elements 5a, 5b identified in the explanation of the rejection are metallization "contact surfaces", and are not identified as "heat sinks" and are not identified as having the capability to perform as heat sinks.

Hokuyo does not disclose the limitations of claim 1.

Claims 2-8 and 10 depend from claim 1 and are therefore also allowable.

**Ground 5.** Claims 16-18 are rejected under 35 USC 103 over Hokuyo '491. Applicant traverses this ground of rejection.

Claim 16 recites in part:

"a heat sink"

Hokuyo does not disclose a heat sink. The explanation of the rejection identifies element 403 of Hokuyo as a heat sink. Element 403 is in fact an electrode, and there is no teaching that Hokuyo serves as a heat sink.

Amended claim 1 also recites:

"a solar cell having...a back side..., wherein the solar cell includes a back-side metallization at the back side; and  
an intermediate structure disposed between and joined to the back-side metallization of the solar cell and to the heat sink..."

If there is an attempt to analogize the electrode 403 of Hokuyo to the recited heat sink, then there is no heat sink. If there is an attempt to analogize the electrode 403 of Hokuyo to the heat sink, then there is no back side electrode.

Hokuyo does not disclose the limitations of claim 16.

Claims 17-18 depend from claim 16 and are therefore also allowable.

**Ground 6.** Claims 19-20 are rejected under 35 USC 103 over Hokuyo '491 in view of Glenn '396. Applicant traverses this ground of rejection.

Claims 19-20 depend from claim 16 and include its limitations. Hokuyo does not teach the limitations of claim 16 for the reasons discussed in the discussion of the Ground 5 rejection, and which are incorporated here. Glenn adds nothing in this regard, for the reasons discussed in relation to the Ground 3 rejection, inasmuch as key recitations of claim 16 are also found in claims 1 and 11.

Additionally, claim 19 recites in part:

“the joint comprises a metallic trace deposited upon a dielectric layer.”

The explanation of the rejection identifies the metallic trace of Hokuyo as the metal trace 19 and the conducting element 17, and the dielectric layer as the bonding element 18. From the geometry of Figure 1 of Hokuyo, it is clear that the metal trace 19 and the conducting element 17 cannot be deposited upon the bonding element 18--they are side by side.

Claim 20 recites in part:

“the joint comprises a PC board having a metal trace on a face thereof.”

Neither reference teaches a PC board. The explanation of the rejection argues that “the structure of the joint taught by Glenn is indistinguishable to that of the PC board. Applicant understands that the explanation of the rejection is asserting that elements 17, 18, and 19 of Glenn have the same configuration as a PC board. They do not. In a PC board, metallic traces are deposited overlying a broad face of a nonconductor.

Applicant asks that the Examiner reconsider and withdraw the rejections.

-11-

**CONCLUSION**

For at least the reasons set forth above, Applicant respectfully requests reconsideration of the Application and withdrawal of all outstanding objections and rejections. Applicant respectfully submits that the claims are not anticipated by, nor rendered obvious in view of; the cited art either alone or in combination and thus, are in condition for allowance. Thus, Applicant requests allowance of all pending claims in a timely manner. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact the Applicant's undersigned representative.

This Response has been filed within three (3) months of the mailing date of the Office Action and it is believed that no fees are due with the filing of this paper. In the event that Applicant is mistaken in these calculations, applicant requests any extension of time that may be necessary and the Commissioner is hereby authorized to deduct any fees determined by the Patent Office to be due from the undersigned's Deposit Account No. 50-1059.

Dated: May 30, 2007

Respectfully submitted,

McNees Wallace & Nurick LLC

Phone: (717) 237-5226  
Fax: (717) 237-5300

/Carmen Santa Maria/  
Carmen Santa Maria  
Reg. No. 33,453  
100 Pine Street  
P.O. Box 1166  
Harrisburg, PA 17108-1166  
Attorney for Applicant